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## (54) EXPANDER FOR SETTING EXPANDABLE LINERS IN WELLS

The invention relates to devices for the repair of casings of water, oil, and gas wells in order to restore hermetic tightness and isolate permeable beds in uncased wells.

An expander for setting expandable liners in wells is known which comprises a rod and flexible sectors in the form of a collet that are positioned on it [1].

A shortcoming of that expander is its inability to be used in holes with different inside diameters without replacement of the flexible sectors.

An expander for setting expandable liners in holes is known which includes a rod with a collet positioned on it and with flexible sectors one end of which is secured to the rod [2].

A shortcoming of that expander is the large number of parts with friction surfaces involved in the process of expanding the liner, which may lead to the jamming of any moving parts as a result of the development of gaps and the clogging of the gaps between them.

The object of the invention is to increase the operational reliability of the device by reducing the friction surfaces in the liner-expansion process.

The stated object is attained by virtue of the fact that the collet is rigidly connected to the rod, and the sectors have lugs on the inside surface to interact with the conical surface of the collet.

Figure 1 gives a schematic illustration of the proposed expander for setting expandable liners in wells; Fig. 2 presents section A-A in Fig. 1.

The expander has a rod 1, which in its top part is implemented with a cone swage 3 that supports liner 2 and with a stop 4, and in its lower part is threaded; a movable cone swage 5, which interacts with the flexible sectors 6, which are confined by ring 7; an adjusting collet 8, which is connected by a thread to rod 1; a return spring 9; and a nut 10. The flexible sectors have a lug 11 on the inside surface to interact with the conical surface of collet 8.

The expander works as follows.

The adjusting collet 8 is set in the position corresponding to the overall diameter of the expanded sectors, the specified hole diameter. When the expander is pulled into liner 2, which is supported by cone swage 3, the bottom end of the expandable liner switches the expander to the working position, moving downward to stop 4 the movable cone swage 5 with flexible sectors 6, which are pushed apart by adjusting collet 8 to the specified position and compress return spring 10. As this occurs, the interacting surfaces come into contact at lug 11 of sectors 6.

The liner is expanded successively by supporting cone swage 3, movable cone swage 5, and flexible sectors 6. After the entire liner is expanded and the expander emerges from it, the return spring 10 switches the expander to the transport position, returning movable cone swage 5 and the flexible sectors upward.

The use of the proposed expander to set liners in wells makes possible an increase in operational reliability in well remedial work, an increase in the operability of the device, and the elimination of accidents during the setting of expandable liners.

### Claims

An expander for setting expandable liners in wells, which comprises a rod with a collet that is positioned on it and with flexible sectors one end of which is secured to the rod, said expander being *distinctive* in that in order to increase the operational reliability of the device by reducing the friction parts in the liner-expansion process, the collet is rigidly connected to the rod, and the sectors have lugs on the inside surface to interact with the conical surface of the collet.

### Information Sources Taken Into Consideration in the Expert Review

1. Sidorov, I. A. *Restoration of the Hermetic Seal of Casings in Oil and Gas Wells* [in Russian], VNIIOENG [All-Union Scientific Research Institute for the Organization of Oil-and-Gas Industry Management and Economics], Moscow, 1972, p. 56.
2. Soviet Authorship Certificate under Application No. 2513231/03, classification E 21 B 29/00, 1977 (the prior art).